



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/599,150	06/21/2000	Stuart T. Linsky	22-0133	6920

7590

08/12/2004

Patent Counsel  
Northrop Grumman Space Technology  
One Park, E1/2041  
Redondo Beach, CA 90278

EXAMINER
----------

FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
----------	--------------

2663

13

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/599,150

Applicant(s)

LINSKY ET AL.

Examiner

Derrick W. Ferris

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/28/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/18/04 has been entered.

### *Response to Amendment*

2. **Claims 1-5,7-22** as amended are still in consideration for this application. Applicant has amended claims 1, 9 and 17.

3. Examiner **withdraws** the obviousness rejection to *Dent* in view of *Peyrovian* for Office action filed **03/19/04**. The examiner has replaced the rejection with references that clearly teach a multiple beam antenna in contrast to phased array antenna taught by the references in the withdrawn rejection.

Note that in the first obviousness rejection below that the applicant does not further clarify that the memory comprises queues assigned to respective hop locations. The second obviousness rejection takes the above limitation into consideration; however, the reference used to teach the above limitation may be from the same assignee.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2663

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application 2003/0207684 A1 to *Wesel* in view of U.S. Patent No. 6,593,893 B2 to *Hou et al.* ("*Hou*") and U.S. Patent No. 5,905,957 A to *Olds et al.* ("*Olds*").

In making a proper obviousness rejection under MPEP 706.02(j), the examiner will address the following four steps:

- a) *the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line numbers where appropriate;*
- b) *the difference of differences in the claim(s) over the applied cited references;*
- c) *the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter; and*
- d) *an explanation why one skilled in the art at the time of the invention was made would have been motivated to make the proposed modification.*

As such to **claim 1**, for step (a) *Wesel* discloses a means for receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells in e.g., figure 4. In particular, *Wesel* teaches for geo satellites the antenna array 32 is a multibeam antenna array, see e.g., paragraph 0037 on page 3. Thus *Wesel* also discloses a multiple beam downlink antenna comprising a plurality of radiating elements, each of which is responsible for generating an independently controllable downlink beam to one of an equal plurality of terrestrial cells. In addition, *Wesel* also discloses means for controlling selection of downlink beams in a beam hopping manner, including a switch that directs the waveform derived in part from each uplink data packet to a selected radiating element of the multiple beam downlink antenna in response to a hop selection signal derived from the destination information in the packet and wherein the multiple beam downlink antenna directs the

waveform derived from the uplink data packets, by beam hopping to the appropriate destination terrestrial cells. In particular, the switch 34 and packet switch 41 help switch packets to a destination as shown in figure 4 and paragraph 0039 on page 3 where a multibeam antenna array uses beam hopping, see e.g., paragraph 0036, page 3.

For step (b) *Wesel* is silent or deficient to the further limitation “terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region”, “a self addressed packet switch for routing packets to memory” and “wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels”. In particular, *Wesel* teaches beam spots but does not specifically disclose that the cells are contiguous, see e.g., page 0036 on page 3. *Wesel* also teaches a packet switch but is silent or deficient to memory in the packet switch, see e.g., paragraph 0039 on page 3.

*Hou* teaches the further recited limitation of “terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region” and “wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels” mentioned above at e.g., column 3, lines 55-65 and column 4, lines 7-31. *Olds* teaches the further recited limitation of “terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region” and “a self addressed packet switch for routing packets to memory” mentioned above at e.g., figures 2 and 3, and column 6, line 61 – column 7, lines 36.

For step (c), the proposed modification of the above-applied reference(s) necessary to arrive at the claimed subject matter would be to modify *Wesel* by clarifying

Art Unit: 2663

that the beam layout can be contiguous, that memory is used in a packet switch, and that color control signals are known in the satellite art.

In order to establish a prima facie case of obviousness for step (d), three basic criteria must be met. The three criteria according to MPEP 706.02(j) are as follows:

*First there must be some suggestion or modification, either in the reference(s) themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.*

As such, for step (d) examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to include the further limitation "terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region", "a self addressed packet switch for routing packets to memory" and "wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels". In particular, the motivation for modifying the reference or to combine the reference teachings would be to cover a specific region with respect to a contiguous area, to buffer packets in memory so that they are not lost, and to avoid interference by using color control signals. In particular, *Hou* cures the above-cited deficiency of contiguous cells by disclosing clustering the microcells together to form an area e.g., in column 3, lines 56-65 and using polarization to avoid interference, e.g., at column 4, lines 7-31. *Olds* cures the above-cited deficiency of contiguous cells by disclosing clustering the microcells together as shown in figure 2 and buffers for temporarily storing data received until the data can be processed or transmit buffers to temporarily store data placed by the controller (i.e., packet switch), e.g., at

column 7, lines 1-35. Second, there would be a reasonable expectation of success since all three references disclose using a multibeam antenna. Thus the references either in singular or in combination teach the above claim limitation(s).

As to **claims 7-8**, see e.g., page 3, paragraph 0037 of *Wesel* which discloses feedhorns and reflectors.

6. **Claims 1-5 and 7-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application 2003/0207684 A1 to *Wesel* in view of U.S. Patent No. 6,593,893 B2 to *Hou et al.* ("*Hou*") and U.S. Patent No. 6,738,346 B1 to *Prieto, Jr. et al.* ("*Prieto*").

As such to **claim 1**, for step (a) *Wesel* discloses a means for receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells in e.g., figure 4. In particular, *Wesel* teaches for geo satellites the antenna array 32 is a multibeam antenna array, see e.g., paragraph 0037 on page 3. Thus *Wesel* also discloses a multiple beam downlink antenna comprising a plurality of radiating elements, each of which is responsible for generating an independently controllable downlink beam to one of an equal plurality of terrestrial cells. In addition, *Wesel* also discloses means for controlling selection of downlink beams in a beam hopping manner, including a switch that directs the waveform derived in part from each uplink data packet to a selected radiating element of the multiple beam downlink antenna in response to a hop selection signal derived from the destination information in the packet and wherein the multiple beam downlink antenna directs the waveform derived from the uplink data packets, by beam hopping to the appropriate destination terrestrial cells. In particular, the switch 34 and packet switch 41 help switch

packets to a destination as shown in figure 4 and paragraph 0039 on page 3 where a multibeam antenna array uses beam hopping, see e.g., paragraph 0036, page 3.

For step (b) *Wesel* is silent or deficient to the further limitation “terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region”, “a self addressed packet switch for routing packets to memory” and “wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels”. In particular, *Wesel* teaches beam spots but does not specifically disclose that the cells are contiguous, see e.g., page 0036 on page 3. *Wesel* also teaches a packet switch but is silent or deficient to memory in the packet switch, see e.g., paragraph 0039 on page 3.

*Hou* teaches the further recited limitation of “terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region” and “wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels” mentioned above at e.g., column 3, lines 55-65 and column 4, lines 7-31. *Prieto* teaches the further recited limitation of “a self addressed packet switch for routing packets to memory” mentioned above at column 4, lines 35-54.

For step (c), the proposed modification of the above-applied reference(s) necessary to arrive at the claimed subject matter would be to modify *Wesel* by clarifying that the beam layout can be contiguous, that memory is used in a packet switch, and that color control signals are known in the satellite art.



As such, for step (d) examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to include the further limitation "terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region", "a self addressed packet switch for routing packets to memory" and "wherein the switch also provides a color control signal in each downlink beam, to minimize the interference between downlink channels". In particular, the motivation for modifying the reference or to combine the reference teachings would be to cover a specific region with respect to a contiguous area, to buffer packets in memory so that they are not lost, and to avoid interference by using color control signals. In particular, *Hou* cures the above-cited deficiency of contiguous cells by disclosing clustering the microcells together to form an area e.g., in column 3, lines 56-65 and using polarization to avoid interference, e.g., at column 4, lines 7-31. *Prieto* cures the above-cited deficiency of buffers by disclosing that buffers are used in a beam selection stage, e.g., at column 4, lines 35-45. Second, there would be a reasonable expectation of success since all three references disclose using a multibeam antenna. Thus the references either in singular or in combination teach the above claim limitation(s).

As to **claim 2**, see e.g., column 4, lines 35-54 of *Prieto* where queues correspond to different beam hop locations.

As to **claims 3-5**, see e.g., figure 3 and column 3, lines 1-15 where queuing is performed in the downlink scheduler based on priority and coding rate as well as QoS.

As to **claims 7-8**, see e.g., page 3, paragraph 0037 of *Wesel* which discloses feedhorns and reflectors.

As to **claim 9**, see the combined rejections for claims 1 and 2.

As to **claim 10**, see similar rejection for claim 8.

As to **claim 11-12**, see similar rejections for claims 3 and 4.

As to **claims 13-16**, see e.g., paragraph 0039 of *Wesel* in view of paragraph 0028 which teaches ATM. In particular, *Wesel* teaches decoding and then (re)encoding the packet thus teaching placing a new header where the new header is an ATM header since ATM is also taught by the reference.

As to **claim 17**, see similar rejection for claim 9.

As to **claim 18**, see similar rejection for claim 3.

As to **claims 19-20**, see similar rejection for claims 3-5.

As to **claim 21**, see similar rejection for claim 13-16.

7. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application 2003/0207684 A1 to *Wesel* in view of U.S. Patent No. 6,593,893 B2 to *Hou et al.* ("*Hou*") and U.S. Patent No. 6,738,346 B1 to *Prieto, Jr. et al.* ("*Prieto*") in further view of U.S. Patent 5,617,108 to *Silinsky et al.* ("*Silinsky*").

As to **claim 22**, *Wesel*, *Hou* and *Prieto* are silent to using a ferrite switch.

Examiner notes that it would have been obvious to someone skilled in the art prior to applicant's invention to use a "ferrite switch" for switching. As support and motivation, *Silinsky* cures the above-cited deficiency by disclosing that ferrite switches are well known in the art as an alternate to switching (column 7, lines 5-15; figure 7). Thus *Silinsky* provides a motivation for using a "ferrite switch". One skilled in the art would

Art Unit: 2663

have been motivated to modify the references to include a ferrite switch as an alternate to switching.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DWF

Derrick W. Ferris  
Examiner  
Art Unit 2663

KWANG BIN YAO  
PRIMARY EXAMINER